LG SF6 LOAD BREAK SWITCHS

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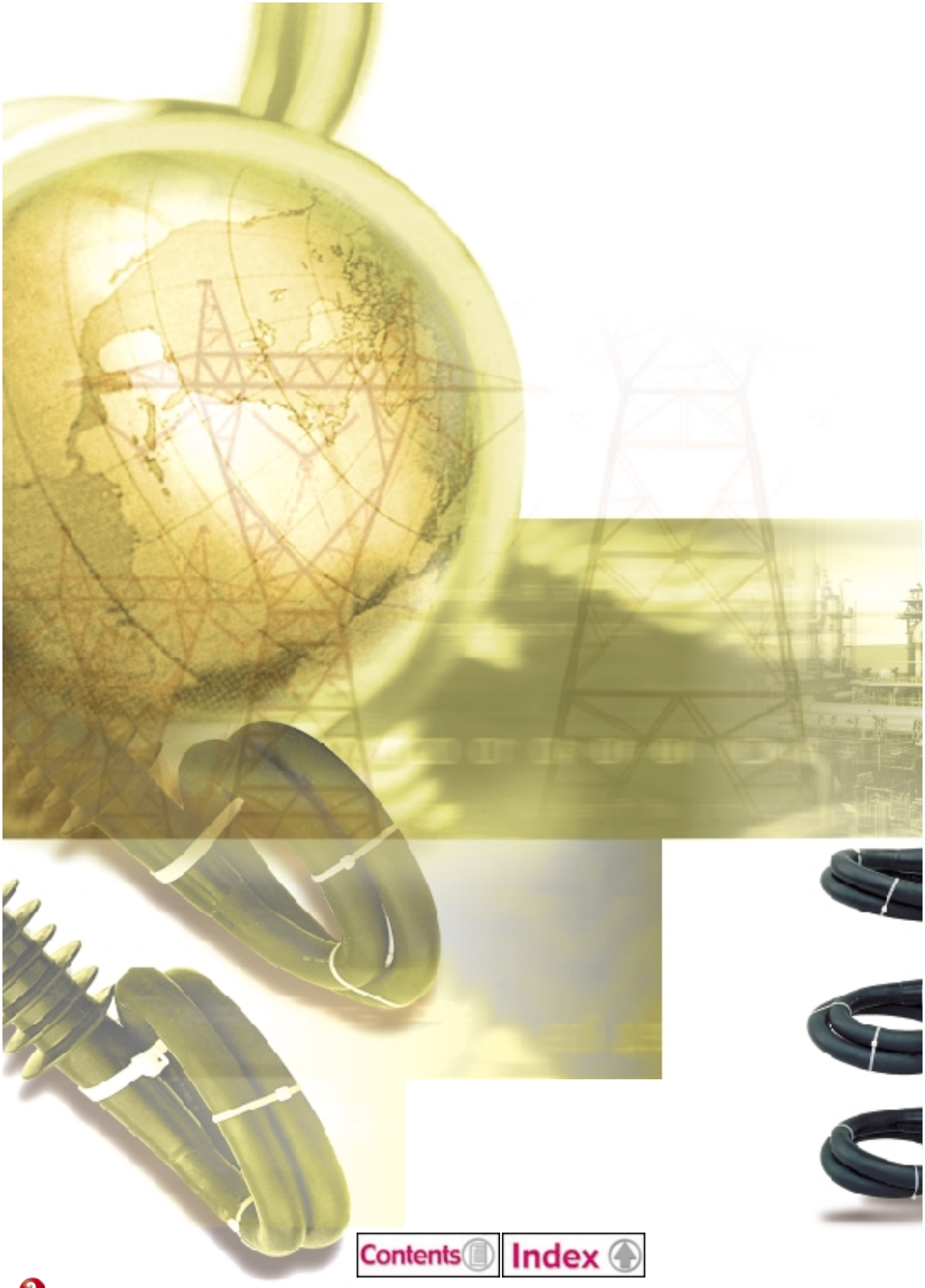
LG Industrial Systems

LG SF_6 LOAD BREAK SWITCHES

LG SF_6
Load Break Switches

Polemounted Type



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Feature and characteristics

LG polemounted SF_6 load break switches are designed to meet the growing requirements for oil-free, maintenance-free, long life, maximum safety and future feeder automation application. SF_6 gases as insulating and arc-quenching medium and the puffing principle ensure the positive breaking of small current, main active load current, cable charging current, magnetizing current, etc. LG switches have two types of operating mechanism,manual type and remote operating by motor. The basic mechanism is an independent quick-close, quick open operator and is combined with geared motor and opening mechanism. The motor mechanism is designed mainly for feeder automation to meet the requirements of dead line operation, low cost, the same reliability with manual switch, but still have enough high closing and opening speed (within one second after receiving the close or open command)

- SF_6 gas insulation interruption, no plastic bridge between open gaps.
- Rated insulation and interruption level are available to meet zero gas pressure. (atmospheric pressure)
- Low voltage closing and motor operation are available.
- Safety feature of bursting membrane for protection of internal arc failure.
- Low gas pressure interlocking device to prevent from switch closing when the gas pressure is under 0.5kg·f/cm²· G
- Anti pollution characteristics
  - Pollution density:
    0.35mg/cm² with moldcone
    0.06mg/cm² without moldcone
- Stainless steel tank(enclosure) fully sealed and insulated by SF_6 gas for long life.
- Oil-less design lets you install these switches without worry or need for ventilation, drainage or fire-proof as with oil-insulated switches.

Design feature and Structure

Switch tank
The switch tank is made of stainless steel sheets(STS304L) and sealed specially for long life, maintenance free.

Anti-expulsion device (Safety valve)
The switch has an expulsion membrane to prevent the destruction of the case when the internal gas pressure rises upto 4.0~6.0kg · f/cm² · G abnormally. The direction of expulsion is opposite side of manual operating handle.

Low pressure inter-locking device
The low pressure inter-locking device operates to lock the manual operating handle and the electrical close, open circuit when the inner pressure leaks to 0.5~1kg · f/cm² · G

Gas filling valve
The gas filling valve is locted at the side of bursting membrance to fill up SF_6 gas of switch tank.

Main circuit of contacts
The tulip type of main contacts with arc resistant material(Cu-W) ensure the long contact life and high short-circuit making capability.

Arc quenching method
The puffing principle ensures the positive breaking from small current up to rated current with extremely short arcing time (within 0.5 Cycle) so that the arc-by-products are negligible even after the test duty.

Mositure absorber
The moisture absorber packed by compounded zeorum is enclosed inside the tank to absorb any moisture decompose SF6 gas caused by the electric arc during switching operation.

Mounting channel
The switch is installed on to the cross arm (90 ~ 120mm²) by the hanger plate (STS or hot-rolled steel) and hook bolt (Stainless or hot-rolled steel bolts)
*This mounting bracket and hanger can be changed depending on customer's requirements.

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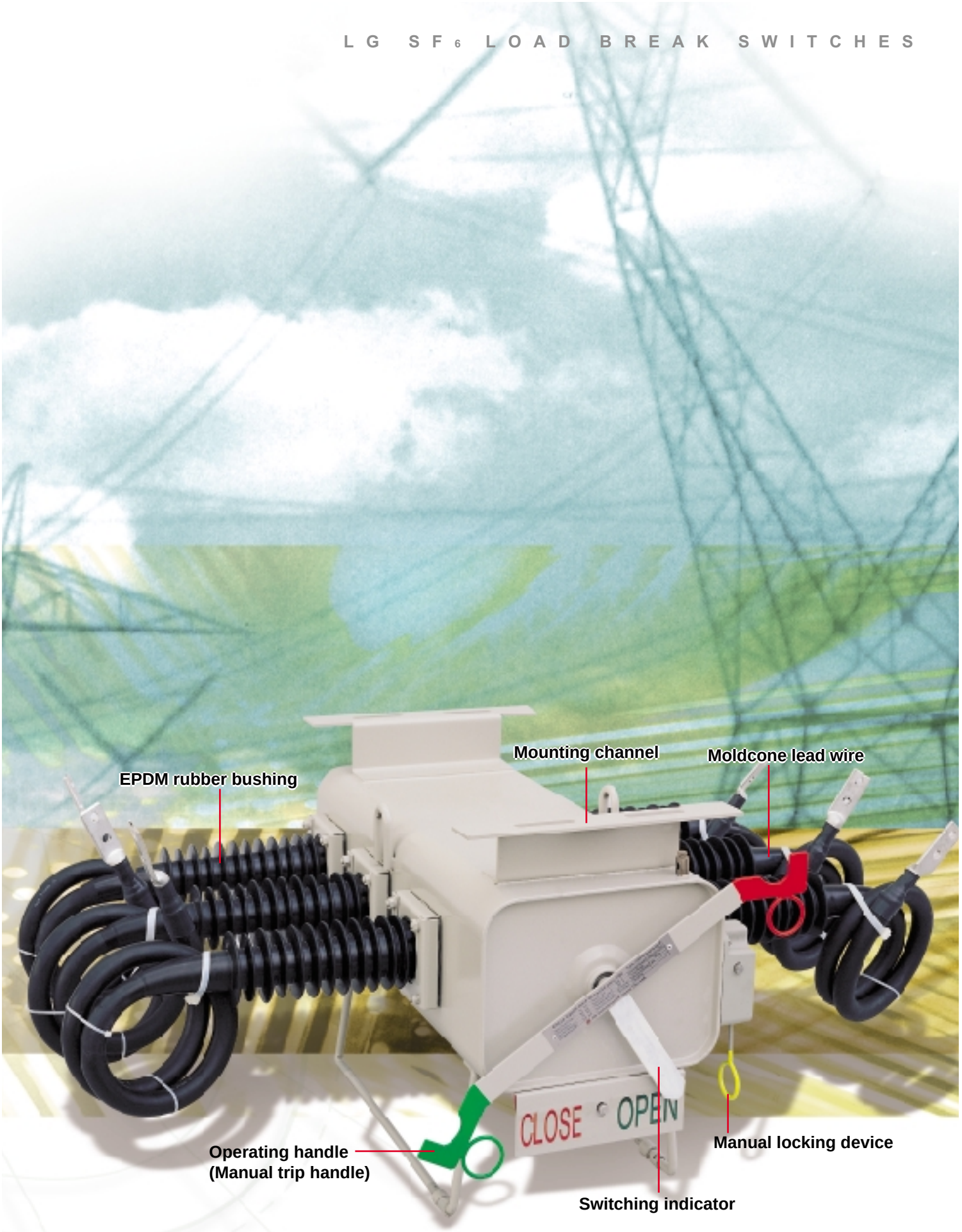

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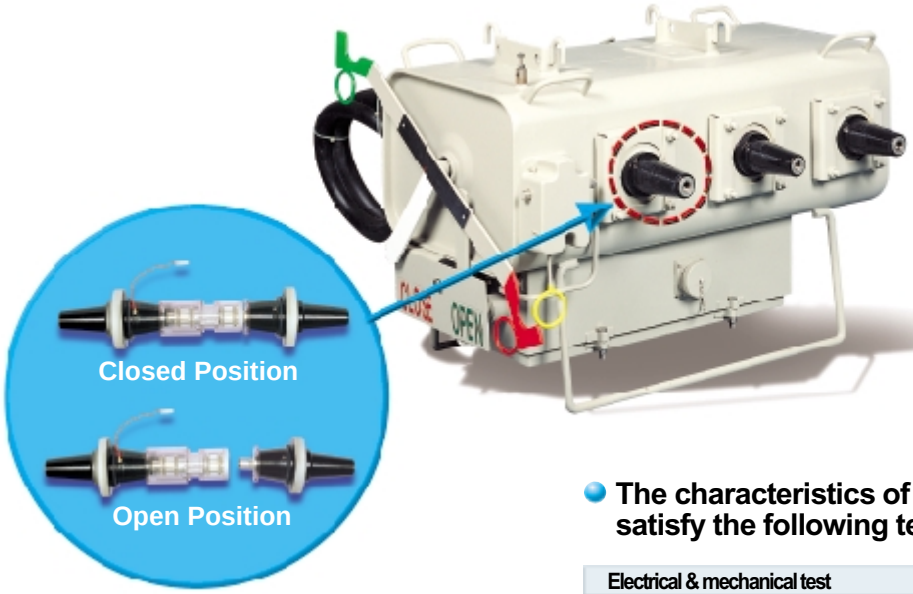
Design feature and structure



The characteristics of bushing satisfy the following testing characteristics

Electrical & mechanical test		
Dry withstand test		AC 60kV/1min.
Water diffusion test		AC 60kV/1min.
Impulse withstand test	Positive	150kV BIL, 1.2 ×50 ㎲, each five times
	Negative	
Partial discharge test		Less than 3pc at 19kV(or 11kV)
Wet withstand test		AC 60kV/10sec.
Temperature rise test		Max. 50℃ Rise
Mechanical strength test		Non-allowance of bonding surface pull-off, wire breakage, sealing failure
Contaminant resistance test		5% F.O.V.Min.25.8kV
Material test		
Tracking resistance test		Tracking should not occur in 6 hours at 4.5kV
Weatherability test		NO surface defects such as cracks an blisters after exposure in weather-O.meter for 1000 hours.
Flammability test		FV-O in accordance with IEC 707
Ozone resistance test		No cracks on the surface
Water absorbing test		Absorption rate nor cracks
Cold-cracking resistance test		Neither defects nor cracks
Heat aging test		Tensile strength & elongation to be each more than 80% of initial value
Tensile test		Tensile strength Min.0.4kg/mm^2 elongation Min. 200%

Bushings and insulators

The bushing consists of epoxy bushing and the insulation cap for leading wire. The insulation cap and the leading wire are integrated together, light and easy for handling.
The test point of the bushing.
The conductor of bushing is made by copper alloy having good mechanical strength and good conductivity, and needs stud connection.
The insulation part of the bushing is to be made of epoxy material having excellent material and electrical characteristics and the insulation cap is to be made of flame-retardant EPDM rubber having excellent insulation characteristics. The manufacturing process should be injection mold press.
The bushing and the insulation cap is in black.

Order information

LG Gas Switch

Type of switch
O : Polemounted Switch
M : Polemounted Switch for SCADA

Operating method
B : Manual
M : Motor
R : Motor for remote control

Rated Voltage
12 : 10/12kV
15 : 13.8/15kV
24 : 24/25.8kV

Switch configuration
21 : 2Way 1Switch

Impulse withstand voltage
07 : 75kV BIL
09 : 95kV BIL
12 : 125kV BIL
15 : 150kV BIL

Rated current
2 : 200 Amp.
4 : 400 Amp.
6 : 600/630Amp.

Ratings and specifications

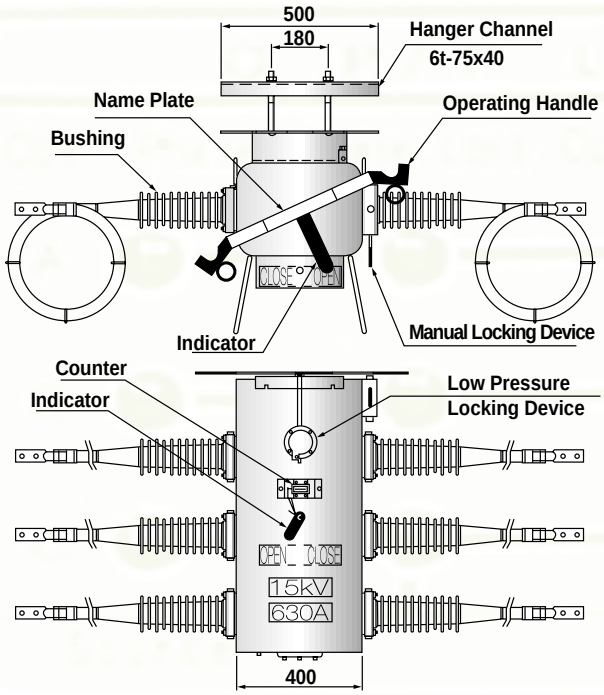
Voltage ratings			
Nominal system voltage	V	13.8	22
Rated voltage	V	15	24
Rated power frequency	Hz	50/60	50/60
Power frequency withstand voltage at dry condition			
●To ground and between phase	kV/1min.	34	60
●between open contacts	kV/1min.	38	60
Power frequency withstand voltage at wet condition			
●To ground and between phase	kV/1min.	34	50
●between open contacts	kV/1min.	38	50
Impulse withstand voltage			
●To ground and between phase	kV	95/110	125/150
●between open contacts	kV	110/125	125/150
Corona extinction(Partial discharge) voltage	kV	11	19
Radio interference voltage	μV	250 at 10.5 kV	250 at 10.5 kV
Control voltage for remote operation		110V AC~220V AC 24V DC	110V AC~220V AC 24V DC

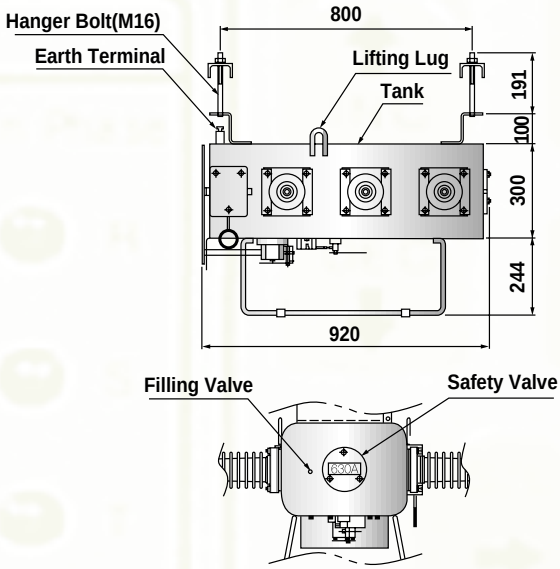
Current ratings			
Rated normal current	A	400/630	400/630
Rated load breaking current	A	400/630	400/630
Rated short- time withstand current	kA, rms/1sec.	12.5/16	12/12.5
Rated short- circuit making current	kA, peak	31.2/40	30/31.2
Rated breaking capacity			
●100% of mainly active load current	A	400/630	400/630
●5% of mainly active load current	A	31.5	31.5
●Magnetizing current(No load transformer)	A	21	21
●Closed loop current	A at 3kV	630	630
●Cable charging current	A	10	25

Mechanical ratings and application information		
Mechanical life		
●Load break operation(Tested)		200
●600A load break operation(Guaranteed)		1,000
●Mechanical operation at no-load(Tested)		1,000
●Mechanical operation at no-load(Guaranteed)		2,000
●Making current operation		2C
SF_6 Gas pressure		
●Normal operation pressure at 20℃	kg · f/cm²	1.5
●Minimum operation pressure at 20℃	kg · f/cm²	0.5
SF_6 Gas quantity	kg	1.4
Weight		
●Manual operation type	kg	160
●Motor operation type	kg	180
●Remote controller	kg	75
Operating mechanism		Maunal or Motor
ARC extinction device and medium		Puffer tube by SF6 Gas
Material of bushings		EPDM Rubber or Porcelain
Cable connection method		Moldcone lead wire or NEMA 2 Terminal

Outline dimension

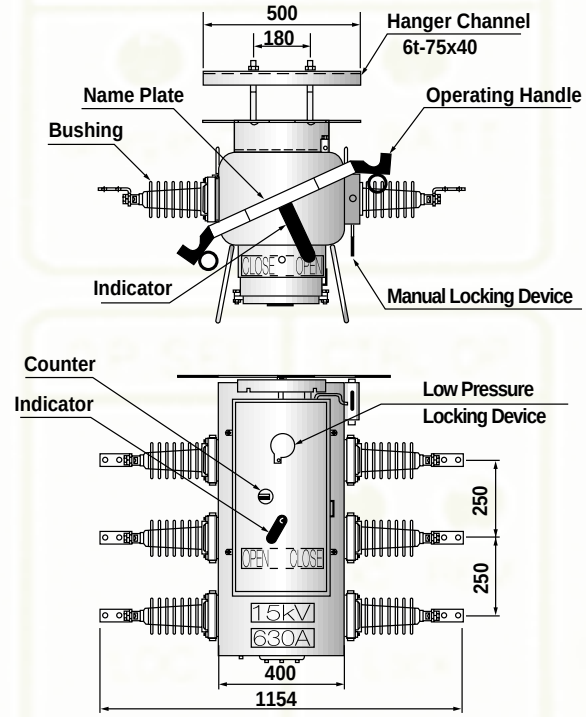
Manual Switch

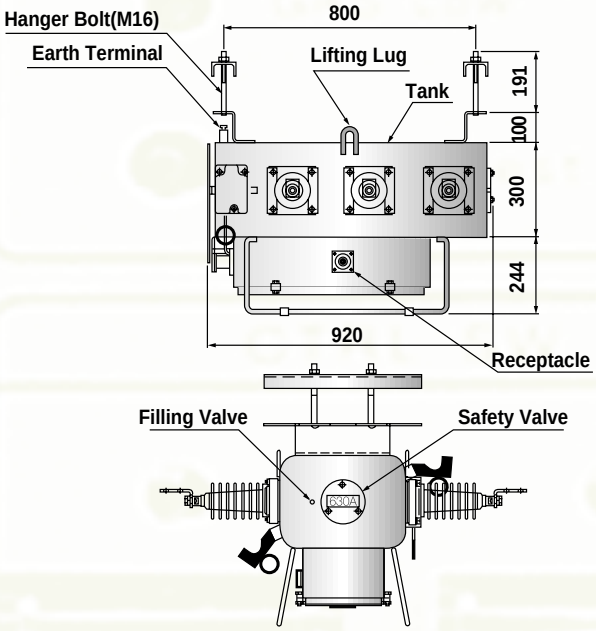




Rear View

Remote controlled switch(Motor operation)

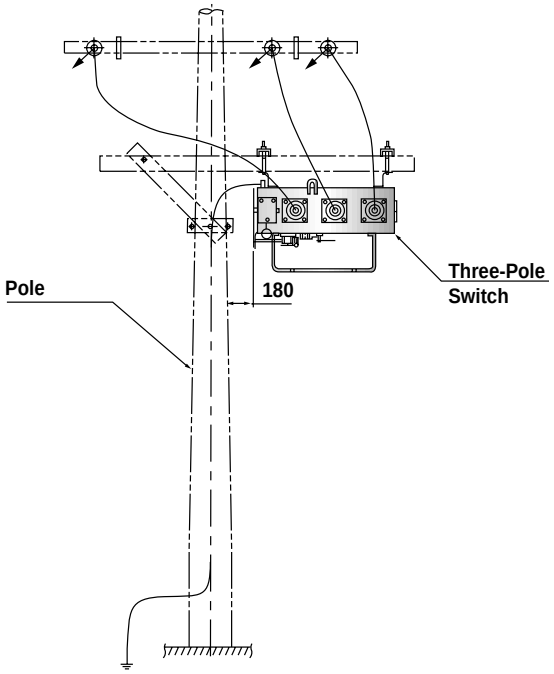




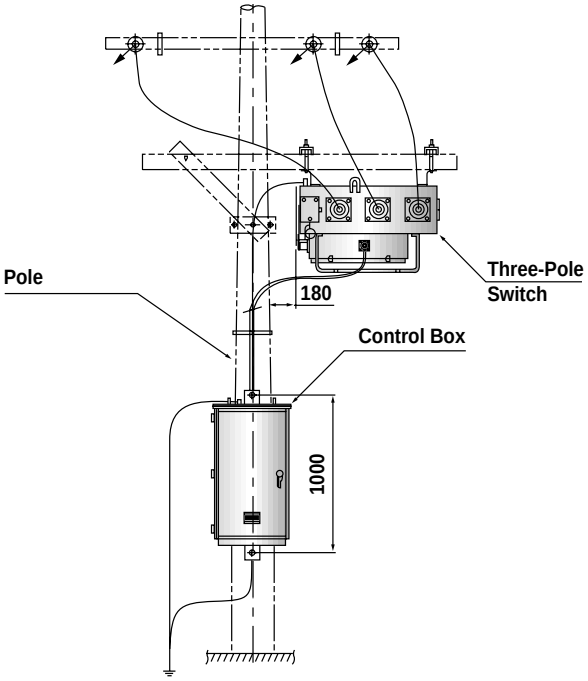
Rear View

Outline dimension

Installation for pole mounting

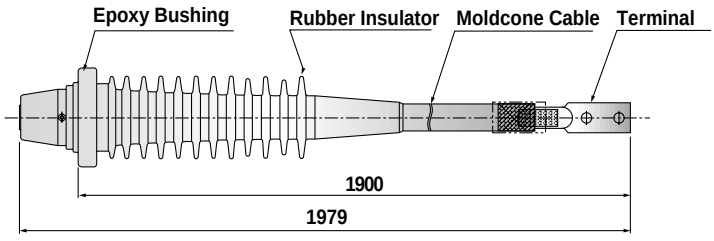


Manual switch

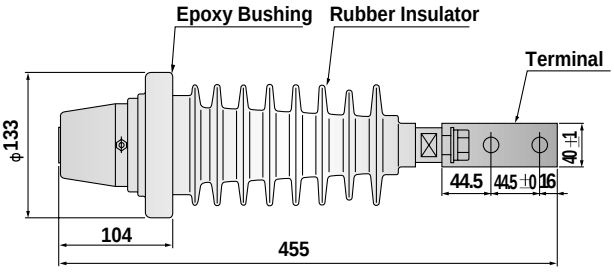


Remote controlled switch

EPDM rubber insulator



Moldcone lead wire with NEMA terminal



Without moldcone lead wire

Operating method of switch

Installation of switch

1. At moving and installing switches the handle grip or hole of the hanger should be used
2. Tighten the clamp using the hanger bolt to the cross arm
3. The pressure bursting membrane is located at the rear side of manual operating handle to install the switch for preventing the people of other devices from undesired accident
4. Earth and earth terminal confirmly If the earth terminal is floated, the internal battery charger may not work (remote controlled switch)
5. Connect the control cable between a mechanism box and control box. When the cable is not used please attach the protective cap to the connector.

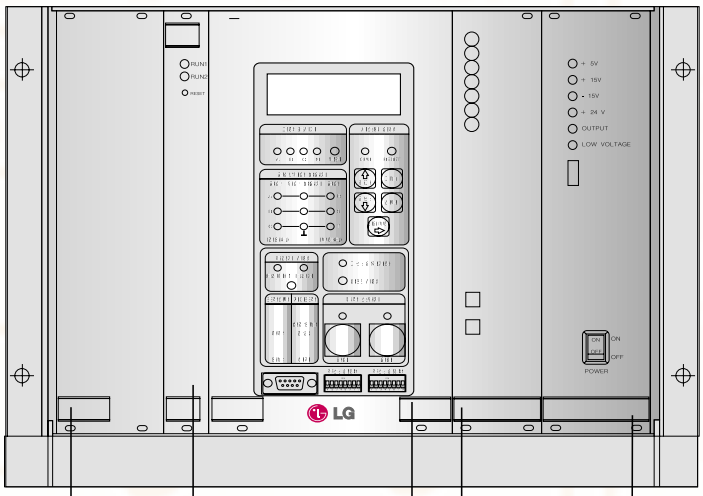
Motor operating mechanism

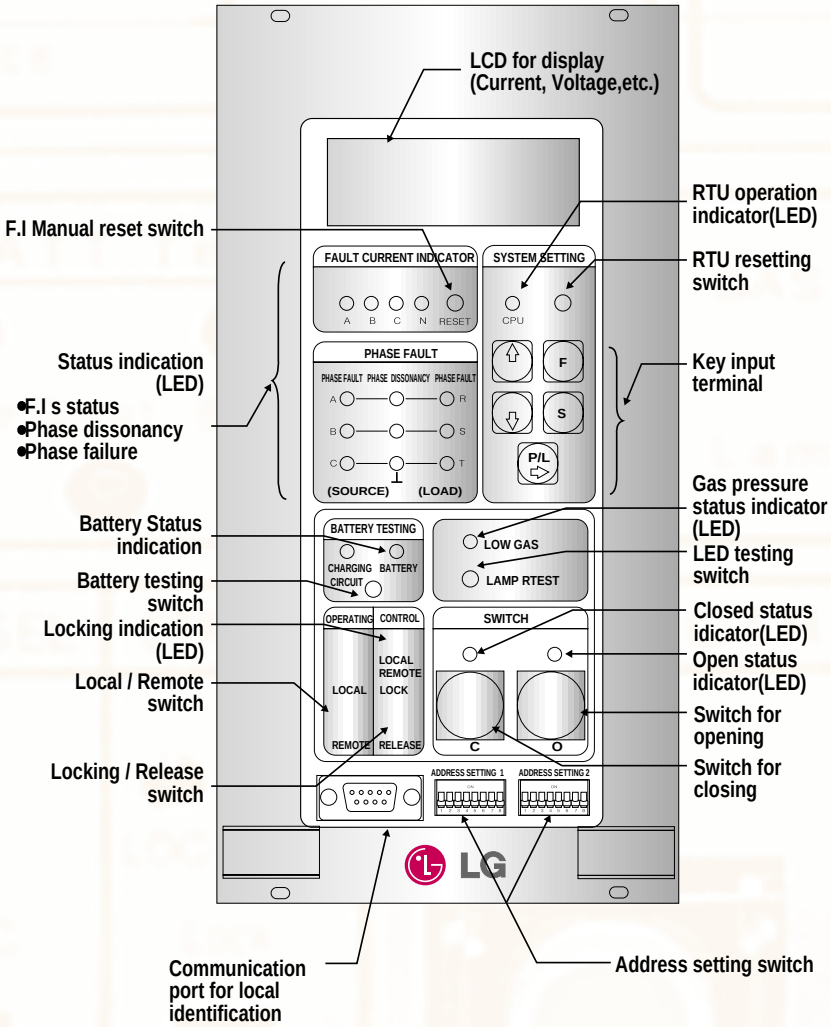
This operation mechanism was designed mainly for distribution automation.
The basic operating mechanism is operator independent quick-close, quick open spring toggle mechanism. But the motor driven shaft connected to the manual operating handle through clutch roller to make free the manual operating from geared motor part after electrical closing and opening so even in case of trouble of electrical part, the simple reliable manual operation is reserved.
The manual closing and open are away one-step operation and free from motor mechanism after electrical operation.
The closing and opening time after receiving the command will be within one second and it well be suited to the YES-NO feeder automation logic using fault indicator.
The anti-pumping and electical trip free are achieved by the control.
The switch status can be identified by the manual operating handle and also by the switch indicator at the bottom of the switch.

Manual operating mechanism

The manual operating mechanism is designed not to require any special skills and all contacts of three phase will be ganged operation to close and open the switch simultaneously.
Also switch operation does not depend on operator's speed, as for closing as for opening.
The contacts closing shaft have operating devices by accumulated energy in springs, so that it will not be possible for the contacts to change from opening or closing position before the accumulated energy is enough to allow the complete and satisfactory performances of those operations.
If operators pull down the right-hand side of the operating handle the indicator of operating handle will be at the position of "CLOSE" and main contacts of switch fully closed.
While the operation handle may be in the opposite direction the switch indicator points at "OPEN".
A manual operating mechanism gives quick make and break of the moving contacts and manual force of the operating handle will be under 20kg.

Remote controller
(including RTU function)





LG constantly endeavors to improve our products, so that information in this catalog is subject to change without notice.

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